INDIAN INSTITUTE OF TECHNOLOGY MADRAS, CHENNAI-600036.

Advertisement No. IITM/R/5/2025 dated 24.09.2025

Syllabus & Scheme of Examination for the post of SENIOR TECHNICAL OFFICER

LEVEL-1 OBJECTIVE / DESCRIPTIVE TEST

Stream: Electrical Engineering (EE) / Electrical & Communication Engineering (ECE) / Electrical & Electronics Engineering (EEE)

Modules 1 and 2 are compulsory for all three streams – EE, EEE & ECE	
EE / EEE	**ECE**
In addition to compulsory modules ONE more Module from Module No. 3 ,4 ,5 & 7 to be attempted	In addition to compulsory modules ONE more Module from Module No. 3 ,4 ,6 & 7 to be attempted

Module 1: Circuits

Ideal voltage and current sources, R, L, C elements; Network solution methods: KCL, KVL, Mesh analysis; Network Theorems: Thevenin's, Norton's, Superposition and Maximum Power Transfer theorem; sinusoidal steady-state analysis, resonance.

Module 2: Software, Computers and Networking

Computer hardware – CPU/GPU, ports, and interfacing; basics of computer networking – network addressing and hardware; Operating systems (Windows and Linux) and computer management; website management. Knowledge of software: Python, Matlab and Simulink, PCB Design software.

Module 3: Electronics

Simple diode circuits: clipping, clamping, rectifiers; Circuits using Operational Amplifiers, BJTs and MOSFETs; combinatorial and sequential logic circuits, multiplexers, demultiplexers, Schmitt triggers; sample and hold circuits, A/D and D/A converters.

Module 4: Instrumentation

Bridges and Potentiometers, Measurement of voltage, current, power, energy and power factor; Instrument transformers, voltmeters and multimeters, Phase, Time and Frequency measurement; Signal Generators and Oscilloscopes. Virtual Instrumentation and data acquisition.

Module 5: Power Engineering

Balanced three phase circuits, star-delta transformation, power factor in ac circuits; Basic concepts of electrical power generation, ac and dc transmission concepts, insulators, Distribution systems, Power

factor correction, Circuit breakers. Transformers – single-phase and three-phase, Machines: DC Machines – different types, Induction Machines – wound and squirrel cage, Synchonous Machines – PM and Wound Field, Relevant testing procedures for machines and transformers; Static V-I characteristics and firing/gating circuits for Thyristor, MOSFET; Single and three-phase configuration of uncontrolled rectifiers; SMPS, Single-phase inverter, sinusoidal pulse width modulation.

Module 6: RF and Optics

Laser safety classification (Class 1,2, 3, 4), Units of quantities - mW, nm, dB, dBm, GHz etc; Optical fiber types and dimensions (Single mode and Multimode, sizes), Fiber connectors (SMA, N, K, FC, PC, APC), Visible and IR wavelengths ranges; Passive devices and their primary function - Attenuators, Splitters/Combiners, Couplers, Isolators, Circulators, Filters, Collimators, Polarizers, Waveplates, Lenses; Detectors - Responsivity, Saturation, Signal to Noise ratio; Optical/RF Spectrum Analyzer - Function, Wavelength Calibration

Module 7: Lab Technology and Management

Clean room management, lab safety protocols. Basics of air conditioning management – chillers and pumps, earthing and power supplies; Diagnostics and debugging of Fabrication and Characterization equipment; micro fabrication and electrical/optical characterization; Tenders and purchase processes.

LEVEL-2 PRESENTATION & PERSONAL INTERVIEW

The Candidates should make a brief presentation, approximately 6 slides, to the Selection Committee covering a brief profile of the applicant, contributions to research project(s) / Academic activities, Future Plans, & Contributions for IIT Madras as a Senior Technical Officer. The candidate should complete the presentation within 6 minutes.

Scheme of Examination:

Level	Type of Test	Weightage for final result
Level-1	Objective / Descriptive Test	50%
Level-2	Presentation & Personal Interview	50%

Based on the performance in the Level-1 Objective / Descriptive Test, the candidate will be shortlisted for the Level-2 Presentation & Personal Interview.

Date: 13.01.2026

Sd/-
Registrar